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Ghost shrimps, snails, and clams on intertidal sandflats in the Ariake Sound estuarine system: seeking for a unified perspective on their population explosions and declines

In the Ariake Sound estuarine system, two congeneric callianassid shrimps, *Nihonotrypaea harmandi* and *N. japonica*, generally occur separately along salinity gradient. The former and latter species appear mainly in the (mixo-)euhaline and mixo-polyhaline waters, respectively. The population explosions of both species happened on respective intertidal sandflats in the early 1980's (and probably from the late 1970's). Such state of high density and widespread occupancy on each sandflat has continued for over 10 years. Accompanying this, on several sandflats inhabited by *N. harmandi*, one of the most dominant species, the gastropod, *Umbonium moniliferum*, and associated species went extinct. On one of these sandflats, however, following the recent decline of the *N. harmandi* population most probably due to a sudden increase in the predation impact by the stingray *Dasyatis akajei*, the local populations of *U. moniliferum* and other species have started to recover. On sandflats inhabited by *N. japonica*, the fisheries production records indicate a rapid increase in the yield of the manila clam, *Ruditapes philippinarum*, from 1973, with its peaks during 1976 to 1980, followed by a steady decline until now. The latter might be due to harmful effects from *N. japonica* (and *Upogebia major*). Recently a remarkable increase in the population of the eagle ray, *Aetobatus flagellum*, occurred in this part of the estuarine system, but no signs of top-down control over the benthic community are evident. This eagle ray mainly feeds on clams. Although our synthetic investigation is still limited, a hypothetical unifying perspective on these phenomena is presented, including bottom-up effects on larval survival (due to the progress of eutrophication), top-down controls over benthic communities, and metapopulation dynamics related to local species extinction and recovery.